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KIM, HEE-YONG	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/586,352	Applicant(s) MAEDA, MITSURU	
	Examiner HEE-YONG KIM	Art Unit 2482	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 17 July 2006.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-29 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-8 and 10-29 is/are rejected.

7)☒ Claim(s) 9 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 17 July 2006 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 7/17/2006 and 8/11/2008.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims **24-28** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claims **24-26**, computer program per se is not statutory. Therefore, they are rejected.

a). The computer program as claimed doesn't isn't properly associated with the operation. It is quite possible that the computer program may be an unrelated sub-routine or a simple commence instruction which then causes the computer to execute the operation that could be self-resident, and not encoded on the medium. The Examiner suggests that the computer program be more directly associated with the operation, <u>Interim Guidelines, Annex IV (Section b).</u>
Correction to the claims and supporting specifications are required.

Regarding claims **27-29**, computer–readable storage medium can include transitory medium such as signal. Therefore, they are rejected.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claim 6** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "difference" in claim 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1-2, 5,** and **16-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (Pattern Recognition Letters 24 (2003), pp.1523-1532), hereafter referenced as Zhang.

Regarding **claim 1**, Zhang discloses Dynamic Selection and Effective Compression of Key Frames for Video Abstraction. Specifically Zhang discloses An encoding apparatus for encoding images of frames (motion compensated inter-coding, pp.1526, right col., line 1-2), which form a moving image by motion compensation, characterized by comprising:

input means for inputting images of frames (every video frame will be scanned, pp.1525, left col., last 3 lines);

section division means for dividing the frames into a plurality of sections (video shots, pp.1525, left col., last 12 lines) on the basis of the images of the frames input by said input means;

representative image setting means for setting one representative image (selected as a key frame, pp.1525, right col., line 12-13) that represents the image of each frame in each of the sections divided by said section division means; and

reference image selection means for selecting one representative image (select one representative frame for each cluster, pp.1525, right col., last 4 lines) to be referred to so as to encode an image of a frame of interest (key frame) from the representative images set for respective sections (clusters), and in that the image of the frame of interest is encoded by motion compensation (motion compensated inter-coding, pp.1526, right col., line 1-2) using the representative image selected by said reference image selection means. However, Zhang fails to disclose *in that the image of the frame of interest is encoded by motion compensation using* ***the images of the frames in the section that includes the representative image*** *selected by said reference image selection means.*

Zhang discloses encoding key frames for the video summary based on reference to key frames. It was obvious to apply the same methodology to encoding whole video sequence using key frames as reference frames because key frames represents whole sequence up to the current picture, in order to improve coding efficiency. It was also obvious to extend the reference images to ***the images of the frames in the section that includes the representative image*** because each image in the same section is

similar to the representative image but equally possible candidate for motion compensation, in order to improve coding efficiency by selecting the frame with the least motion compensation error.

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Zhang by providing specifically encoding whole video in the same way as encoding key frames but motion compensation using the images of the frames in the section that includes the representative image, in order to improve coding efficiency. The Zhang cluster based Key frame encoding, incorporating encoding whole video in the same way as encoding key frames but motion compensation using the images of the frames in the section that includes the representative image, has all the features of claim 1.

Regarding **Claim 2**, claim 2 is similar to the claim 1. The only difference is that in claim 1 the reference frame is selected among the images of the frames in the section that includes the representative image, and in claim 2, the reference frame is the representative image. Claim 2 is obvious over claim 1, because selecting a reference frame as representative image is done by omitting step of further optimization of motion compensation among the images of the frames in the section that includes the representative image, in order to reduce computation cost. Therefore, the Zhang cluster based Key frame encoding, incorporating encoding whole video in the same way as encoding key frames, has all the features of claim 2.

Regarding **claim 5**, Zhang teaches everything claimed as above (see claim 1). Zhang further teaches characterized in that said reference image selection means

calculates prediction errors of motion compensation with an image of a frame to be encoded for respective representative images set in the respective sections, and selects the representative image that minimizes the prediction error (claim 1: in order to improve coding efficiency by selecting the frame with the least motion compensation error).

Regarding **claim 16**, the claim is a method claim corresponding to the apparatus claim 1. Therefore, it is rejected for the same reason as claim 1.

Regarding **claim 17**, the claim is a method claim corresponding to the apparatus claim 2. Therefore, it is rejected for the same reason as claim 2.

6. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Vasudevan (US 6,342,904), hereafter referenced as Vasudevan.

Regarding **claim 3**, Zhang teaches everything claimed as above (see claim 1). However, Zhang fails to disclose characterized in that said section division means comprises difference determination means for determining with reference to images of frames in an order said input means inputs whether or not an image difference between neighboring frames is not less than a predetermined value, and
when said difference determination means refers to images in turn from an image of a first frame, and
determines that a difference between an image of a
second frame and an image of a third frame as a next

frame of the second frame is not less than the predetermined value, said difference determination means sets the first and second frames as one section.

In the analogous field of endeavor, Vasudevan discloses Creating a Slide Representation from Full Motion Video. Vasudevan specifically discloses characterized in that said section division means comprises difference determination means for determining with reference to images of frames in an order said input means inputs whether or not an image difference between neighboring frames is not less than a predetermined value (When the difference between consecutive frames exceeds a predetermined threshold, a segment boundary is detected, col.7, line 11-13), and when said difference determination means refers to images in turn from an image of a first frame, and determines that a difference between an image of a second frame and an image of a third frame as a next frame of the second frame is not less than the predetermined value, said difference determination means sets the first and second frames as one section (Examiner read as "first and second frames are in the one section and the third one in a new section", which is disclosed by Vasudevan as above), in order to detect a scene change (col.7, line 1-4).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Zhang by providing specifically calculating the difference between consecutive frames and dividing video section when the difference exceeds the predetermined threshold, in order to detect a scene change with reduced computation. The Zhang cluster based Key frame encoding, incorporating

encoding whole video in the same way as encoding key frames but motion compensation using the images of the frames in the section that includes the representative image, further incorporating the Vasudevan calculating the difference between consecutive frames and dividing video section when the difference exceeds the predetermined threshold, has all the features of claim 3.

7. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Adler (US 2005/0,028,213), hereafter referenced as Adler.

Regarding **claim 4**, Zhang teaches everything claimed as above (see claim 1). However, Zhang fails to disclose characterized in that said representative image setting means sets, as a representative image, an image of a self frame, which has a smallest sum total value of differences from a group of images of other frames in each of the sections divided by said section division means.

In the analogous field of endeavor, Adler discloses System and Method for User-Friendly Fast Forward and Backward Review of Video. Adler specifically teaches characterized in that said representative image setting means sets, as a representative image, an image of a self frame, which has a smallest sum total value of differences from a group of images of other frames in each of the sections divided by said section division means (the frame that is closest to the centroid is chosen to be key frame for the cluster, paragraph 42), in order to get the optimized key frame.

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Zhang by providing specifically selecting the key frame in a section as the frame with the smallest sum total value of

differences from a group of images of other frames in a section, in order to get the optimized key frame. The Zhang cluster based Key frame encoding, incorporating encoding whole video in the same way as encoding key frames but motion compensation using the images of the frames in the section that includes the representative image, further incorporating the Adler selecting the key frame in a section as the frame with the smallest sum total value of differences from a group of images of other frames in a section, in order to get the optimized key frame, has all the features of claim 4.

8. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Vasudevan, and further in view of official notice.

Regarding **claim 6**, Zhang teaches everything claimed as above (see claim 1). However, Zhang fails to disclose characterized in that the difference is a sum total value obtained by summing up differences between pixel values of corresponding pixels in two images for all or some pixels that form the images.

However, it was well known in the art that a frame difference is defined as a sum total value obtained by summing up the absolute differences (SAD) between pixel values of corresponding pixels in two images for all that form the images.

9. **Claims 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Vasudevan, and further in view of Dufaux (US 6,782,049) (hereafter referenced as Dufaux).

Regarding **claim 7**, Zhang teaches everything claimed as above (see claim 1). However, Zhang fails to disclose characterized in that said section division means further comprises:

determination means for determining whether or
not a frame of interest is included in a section to which a frame immediately before the frame of interest belongs ;

first setting means for, when the frame of interest is included in the section to which the frame immediately before the frame of interest belongs,
setting the representative frame set in the section or the frame of interest as a new representative image in the section on the basis of images of respective frames in the section and an image of the frame of interest;

and second setting means for, when the frame of
interest is not included in the section to which the frame immediately before the frame of interest belongs, setting a new section which is different from the
section and includes the frame of interest.

Vasudevan specifically discloses determination means for determining whether or not a frame of interest is included in a section to which a frame immediately before the frame of interest belongs ;first setting means for, when the frame of
interest is included in the section to which the frame immediately before the frame of interest belongs ; and second setting means for, when the frame of
interest is not included in the section to which the frame immediately before the frame of interest belongs, setting a new section which is different from the

section and includes the frame of interest. (When the difference between consecutive frames exceeds a predetermined threshold, a segment boundary is detected, col.7, line 11-13), in order to detect a scene change (col.7, line 1-4).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Zhang by providing specifically calculating the difference between consecutive frames and dividing video section when the difference exceeds the predetermined threshold, in order to detect a scene change with reduced computation. However, Zhang and Vasudevan still fail to disclose setting the representative frame set in the section or the frame of interest as a new representative image in the section on the basis of images of respective frames in the section and an image of the frame of interest.

In the analogous field of endeavor, Dufaux discloses System for Selecting a Keyframe to Represent a Video. Dufaux specifically discloses setting the representative frame set in the section or the frame of interest as a new representative image in the section on the basis of images of respective frames in the section and an image of the frame of interest (Fig.11 shows that a new keyframe is selected between existing keyframe and the current frame), in order to have an optimum keyframe dynamically based on the distance measure (Fig.11).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Zhang and Vasudevan by providing specifically updating keyframe dynamically based on distance measure, in order to have an optimum keyframe. The Zhang cluster based Key frame encoding, incorporating

encoding whole video in the same way as encoding key frames but motion compensation using the images of the frames in the section that includes the representative image, further incorporating the Vasudevan calculating the difference between consecutive frames and dividing video section when the difference exceeds the predetermined threshold, further incorporating the Dufaux updating keyframe dynamically based on distance measure, has all the features of claim 7.

Regarding **claim 8**, Zhang and Vasudevan, and Dufaux, as applied to claim 7, teaches characterized in that said determination means calculates a difference between an image of a last frame of the section to which the frame immediately
before the frame of interest belongs, and the image of
the frame of interest, and when the calculated difference is not more than a predetermined threshold, said determination means determines that the frame of interest is included in the section to which the frame immediately before the frame of interest belongs (Vasudevan: When the difference between consecutive frames exceeds a predetermined threshold, a segment boundary is detected, col.7, line 11-13).

10. **Claims 10-13, and 18-21** are rejected under 35 U.S.C. 103 (a) as being unpatentable over Tudor (Electronics and Communication Engineering Journal, vol.7, 1995, pp.257-264) in view of official notices.

Regarding **claim 10**, Tudor discloses Tutorial MPEG-2 Video Compression. Tudor specifically discloses An encoding apparatus for encoding images of

frames (Fig.2 (a) Motion Compensated DCT coder), which form a moving image by motion compensation, characterized by comprising:

input means for inputting images of frames (video in, Fig.2(a)) for every predetermined number of frames (GOP (group of the picture), pp.261, right column);

representative image setting means for setting one representative image (I-Picture, pp.261) that represents images of the predetermined number of frames (GOP (group of the picture), pp.261, right column) on the basis of the images of the frames for every predetermined number of frames (GOP (group of the picture), pp.261, right column); and

output means for outputting encoded results (coded bitstream, Fig.2(a)) of the images of the frames input by said input means together with information required to specify the representative image (well known in the art that picture type (I-type) is included in picture header in the encoded bitstream).

Regarding **claim 11**, Tudor discloses specifically A decoding apparatus for decoding an encoded result of images of frames (Fig.2(b) Motion Compensated DCT decoder) that form a moving image by motion compensation, characterized by comprising:

input means for inputting encoded results of images (coded bitstream in, Fig.2(b)) of frames for a predetermined number of frames (GOP (group of the picture), pp.261, right column),

and information required to specify a representative frame (well known in the art that picture type (I-type) is included in picture header in the encoded bitstream) which

represents the frames (Intra frame (I-type) is used for motion prediction by P or B pictures, pp.261) for the predetermined number of frames, which is appended to each of the encoded results of the frames (picture header is well known); and

storage means for storing a decoded result of the representative frame specified by the information (well known in MPEG that there need picture buffer to decode a picture which is motion compensated by I-picture), and

in that the encoded result of an image of each frame input by said input means after the representative frame stored in said storage means is decoded using the decoded result of the representative frame stored in said storage means (P-picture or B-picture use previous I or P-picture for motion compensation, pp.261, left col.).

Regarding **claim 12**, Tudor discloses Tutorial MPEG-2 Video Compression. Tudor specifically discloses An encoding apparatus for encoding images of frames (Fig.2 (a) Motion Compensated DCT coder), which form a moving image by motion compensation, characterized by comprising:

input means for inputting images of frames (video in, Fig.2(a));

setting means for setting an image of a frame input at a predetermined cycle (GOP (group of the picture), pp.261, right column) of the images of the frames input by said input means as an image of a representative frame (I-Picture, pp.261);

switching means for switching an encoding method (I, P, B pictures, pp.261) depending on whether or not a frame to be encoded is a representative frame; and

output means for outputting encoded results (coded bitstream, Fig.2(a)) of the images of the frames input by said input means together with information required to specify the

representative frame (well known in the art that picture type (I-type) is included in picture header in the encoded bitstream).

Regarding **claim 13**, Tudor specifically discloses An encoding apparatus for encoding images of frames, which form a moving image by motion compensation, characterized by comprising:

input means for inputting images of frames (video in, Fig.2(a)) for every predetermined number of frames (GOP (group of the picture), pp.261, right column) ;

output means for outputting encoded results of the images (coded bitstream, Fig.2(a)) of the frames input by said input means together with information required to specify the representative frame (well known in the art that picture type (I-type) is included in picture header in the encoded bitstream).

However, Tudor fails to discloses calculation means for calculating a difference between an image of a frame input by said input means and a decoded image obtained by decoding a result of encoding the image of the frame;

determination means for determining an image of a frame having a smallest difference of the differences calculated by said calculation means for the frames for the predetermined number of frames as a representative image that represents the images of the frames for the predetermined number of frames.

However, it was well known in the art that P and B pictures are motion compensated by previous I-picture or P-picture and therefore there is coding error build up as time goes on until next Intra frame. For example, consider the video sequence, $I_0P_1P_2P_3$… which is first intra frame, and then all P-frames. P_1 frame depend on I-frame,

P_2 frame depend on P_1 frame, and P3 frame depends on P_2 frame. So, all P frames depends on intra frame I_0 either directly or indirectly. Therefore, the coding of Intra frame is very important, because it affects coding quality of all the other frames. Therefore, there is a motivation to select I-frame which has the least coding error, in order to reduce the coding error build-up.

Therefore, given this motivation, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Tudor by providing specifically calculating a difference between an image of a frame input by said input means and a decoded image obtained by decoding a result of encoding the image of the frame, and determining an image of a frame having a smallest difference of the differences for the frames for GOP as a I-frame that represents the images of the frames for GOP, in order to reduce the coding error build-up. The Tudor MPEG coding, incorporating calculating a difference between an image of a frame input by said input means and a decoded image obtained by decoding a result of encoding the image of the frame, and determining an image of a frame having a smallest difference of the differences for the frames for GOP as a I-frame that represents the images of the frames for GOP, has all the features of claim 13.

Regarding **claim 18**, the claim is a method claim corresponding to the apparatus claim 10. Therefore, it is rejected for the same reason as claim 10.

Regarding **claim 19**, the claim is a method claim corresponding to the apparatus claim 11. Therefore, it is rejected for the same reason as claim 11.

Regarding **claim 20**, the claim is a method claim corresponding to the apparatus claim 12. Therefore, it is rejected for the same reason as claim 12.

Regarding **claim 21**, the claim is a method claim corresponding to the apparatus claim 13. Therefore, it is rejected for the same reason as claim 13.

11. **Claims 14-15, and 22-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson (H.264 and MPEG 4 Video Compression, Wiley) (hereafter referenced as Richardson) in view of Zhang.

Regarding **claim 14**, Richardson discloses H.264 and MPEG 4 Video Compression. Richardson specifically discloses An encoding apparatus for encoding images of frames (Fig 6.1 H.264 Encoder), which form a moving image by motion compensation, characterized by comprising:

input means for inputting images of frames (Fn, Fig 6.1);

storage means (F'_{n-1} (reference), Fig 6.1) for storing an image of a representative frame (representative frame is one of reference frame) to be referred to when inter-frame encoding (Inter, MC, Fig.6.1) is applied to an input image input by said input means;

output means for outputting encoded results (Output of Entropy encoder, Fig 6.1) of the images of the frames input by said input means.

However, Richardson fails to disclose calculation means for calculating similarity levels of images stored in said storage means with the input image;

storage control means for, when a minimum similarity level of the similarity levels

calculated by said calculation means for the images stored in said storage means is not less than a predetermined value, storing the input image in said storage means as a representative frame; and

outputting together with information required to specify the representative image.

Zhang specifically teaches calculation means for calculating similarity levels (MCE (motion compensated Error), Equation 2) of images stored in said storage means with the input image;

storage control means for, when a minimum similarity level of the similarity levels calculated by said calculation means for the images stored in said storage means is not less than a predetermined value (If minimal MCE is larger than a threshold, pp.1526, left col.), storing the input image in said storage means as a representative frame (create a new cluster for Fn, pp.1526, left col.), in order to encode key frames efficiently. And also Richardson discloses Reference Picture Management using Adaptive memory control based on long term and short term reference pictures (pp.166-167) and specifying the long term reference by LongTermPicNum (pp.166-167) (*outputting together with information required to specify the representative image*), in order to search for the best match from a wider set of pictures than just the previous encoded pictures (pp.164).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify H.264 by providing specifically generating representative frames in the same way as clustering key frames and encoding using representative frames (representative frames) as Long term

References, in order to search for the best match from wide set including representative pictures. The Richardson H.264 Encoding, incorporating the Zhang clustering key frames into generating representative frames, further encoding using representative frames (representative frames) as Long term References, has all the features of claim 14.

Regarding **claim 15**, Richardson specifically discloses An encoding apparatus for encoding images of frames (Fig 6.1 H.264 Encoder), which form a moving image by motion compensation, characterized by comprising:

input means for inputting images of frames (Fn, Fig 6.1);

storage means (F'_{n-1} (reference), Fig 6.1) for storing an image of a representative frame (representative frame is one of reference frame) to be referred to when inter-frame encoding (Inter, MC, Fig.6.1) is applied to an input image input by said input means;

motion vector calculation (ME (Motion Estimation), Fig 6.1) means for calculating motion vectors with the input image for images stored in said storage means;

output means for outputting encoded results (Output of Entropy encoder, Fig 6.1) of the images of the frames input by said input means.

However, Richardson fails to disclose calculation means for calculating errors of the motion vectors calculated by said motion vector calculation means for the images stored in said storage means;

storage control means for, when a minimum error of the errors calculated by said calculation means for the images stored in said storage means is **not more than** a predetermined value, storing the input image in said storage means as a representative

frame; and

outputting together with information required to specify the representative image.

Zhang specifically teaches calculation means for calculating errors of the motion vectors (MCE (motion compensated Error), Equation 2) of images stored in said storage means with the input image;

storage control means for, when a minimum error of the errors calculated by said calculation means for the images stored in said storage means **is not less than** a predetermined value (If minimal MCE is larger than a threshold, pp.1526, left col.), storing the input image in said storage means as a

representative frame (create a new cluster for Fn, pp.1526, left col.), in order to encode key frames efficiently. And also Richardson discloses Reference Picture Management using Adaptive memory control based on long term and short term reference pictures (pp.166-167) and specifying the long term reference by LongTermPicNum (pp.166-167) (*outputting together with information required to specify the representative image*), in order to search for the best match from a wider set of pictures than just the previous encoded pictures (pp.164).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify H.264 by providing specifically generating representative frames in the same way as clustering key frames and encoding using representative frames (representative frames) as Long term References, in order to search for the best match from wide set including representative pictures. The Richardson H.264 Encoding, incorporating the Zhang clustering key

frames into generating representative frames, further encoding using representative frames (representative frames) as Long term References, has all the features of claim 15.

Regarding **claim 22**, the claim is a method claim corresponding to the apparatus claim 14. Therefore, it is rejected for the same reason as claim 14.

Regarding **claim 23**, the claim is a method claim corresponding to the apparatus claim 15. Therefore, it is rejected for the same reason as claim 15.

Allowable Subject Matter

12. **Claim 9** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim 1 and an intervening claim 7.

Dependent **claim 9** recites "…first threshold setting means for, when the sum value is not less than the sum total value calculated by said first calculation means, setting the sum total value calculated by said first calculation means as the threshold; and second threshold means for, when the sum value is not more than the sum total value calculated by said first calculation means, setting the sum value as the threshold…" which are features that are not anticipated nor obvious over the art of record. Accordingly, if the claims are amended as indicated above, and if rejected claims 1-8, and 10-29 are cancelled, the application would be placed in a condition for allowance.

Allowable Subject Matter

1. **Claims 3, and 14-15** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim 1 (for clam 3) and any intervening claim 2 (for claim 3), and of base claim 11 (for claim 14 and 15) and intervening claims 12 and 13 (for claim 14), and intervening claims 12-14 (for claim 15).

Dependent **claims 3 and 14** recite "...analyzing the data within the data set of the subsequent entity to determine whether an interaction took place between the subsequent entity and an additional subsequent entity; and upon determining that the interaction took place, automatically repeating the backtracking, compiling, and comparing steps for the additional subsequent entity to determine a threat status regarding the additional subsequent entity..." which are features that are not anticipated nor obvious over the art of record. Dependent claim 15 is allowed for the reason concerning dependent claim 14. Accordingly, if the claims are amended as indicated above, and if rejected claims 1-2, 3-13, and 16-17 are cancelled, the application would be placed in a condition for allowance.

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Vahid (US 7,555,658) discloses Embedded Electronics Building Blocks for User-Configurable Monitor/Control Networks.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HEE-YONG KIM whose telephone number is (571)270-3669. The examiner can normally be reached on Monday-Thursday, 8:00am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HEE-YONG KIM/
Examiner, Art Unit 2621

/Andy S. Rao/
Primary Examiner, Art Unit 2482
November 3, 2010